WRITING INSTRUMENT WITH FLUID-CONTAINING BARREL

FIELD OF THE INVENTION

The present invention relates generally to writing instruments and, more particularly, to writing instruments with decorative features.

BACKGROUND OF THE INVENTION

The use of promotional items has proliferated in today's increasingly competitive marketplace, where companies are constantly seeking more effective and new ways to market their products. In the healthcare industry, physicians and other healthcare providers often receive promotional articles from vendors of healthcare-related products, such as pharmaceutical products. These promotional articles often include "everyday" items, such as writing pads, calendars, and pens that have promotional information (indicia) printed thereon. For example, pharmaceutical companies often provide physicians with writing pens having the name of a particular pharmaceutical product printed thereon with the hopes that the pens will help remind the physicians to prescribe the particular pharmaceutical product.

Unfortunately, because of lack of distinctiveness, many promotional articles provided to healthcare providers often become "lost-in-the-shuffle" with other promotional articles. Thus, there is a need

for distinctive, more effective promotional products directed to healthcare providers as well as to others.

SUMMARY OF THE INVENTION

In view of the above discussion, promotional writing instruments are provided. According to an embodiment of the present invention, a writing instrument includes elongated first and second barrel portions. The first barrel portion has an open first end through which a writing element is extendable, and an opposite open second end. The second barrel portion is transparent and hollow and includes an open end and an opposite closed end. The second barrel portion open end is secured within the second end of the first barrel portion. A fluid is disposed within the hollow second barrel portion and is viewable through the transparent second barrel portion. A plug seals the second barrel portion open end such that the fluid is prevented from escaping from the hollow second barrel portion.

The plug includes a shank and a head portion connected to the shank. The head portion extends radially outward from the shank to define a circumferential shoulder. When the shank is disposed within the open second end of the second barrel portion, the shoulder is in contacting relationship with the annular rim of the open second end. The plug head portion tapers radially inward such that the head portion does not contact the inside surface of the first barrel portion second end and such that flexure of the first and second barrel portions relative to one another does not cause the head portion to contact the inside surface of the first barrel portion second end. By avoiding contact, the plug remains undisturbed, thereby avoiding any loss of sealing ability.

According to other embodiments of the present

invention, a light is configured to illuminate the fluid within the hollow second barrel portion in response to user activation. The light is powered via a power source (*e.g.*, battery) disposed within the writing instrument and a user-activateable switch is located on the first barrel portion. The switch is responsive to user activation for switching the light on and off.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a writing instrument, according to an embodiment of the present invention.

Fig. 2A is a cross-sectional view of the writing instrument of **Fig. 1** taken along lines **2A-2A**.

Fig. 2B illustrates the writing instrument of **Fig. 2A** being subjected to flexure.

Fig. 3 is a partial, exploded view of the writing instrument of **Fig. 1** illustrating the barrel end portions thereof and the plug for retaining fluid within the second barrel portion, according to embodiments of the present invention.

Fig. 4 is a perspective view of a writing instrument, according to another embodiment of the present invention, illustrating two fluids within the second barrel portion.

Fig. 5 is a cross-sectional view of the writing instrument of **Fig. 1** taken along lines **2A-2A** and illustrating a plug having a different head configuration.

Fig. 6 is a cross-sectional view of a writing instrument, according to another embodiment of the present invention, illustrating a light that illuminates the fluid within the second barrel portion.

DETAILED DESCRIPTION OF THE INVENTION

The present invention now is described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

In the drawings, the thickness of lines, layers and regions may be exaggerated for clarity. It will be understood that when an element such as a layer, region, substrate, or panel is referred to as being "on" another element, it can be directly on the other element or intervening elements may also be present. In contrast, when an element is referred to as being "directly on" another element, there are no intervening elements present. It will be understood that when an element is referred to as being "connected" or "attached" to another element, it can be directly connected or attached to the other element or intervening elements may also be present. In contrast, when an element is referred to as being "directly connected" or "directly attached" to another element, there are no intervening elements present. The terms "upwardly", "downwardly", "vertical", "horizontal" and the like are used herein for the purpose of explanation only.

Referring now to **Fig. 1**, a writing instrument **10** according to an embodiment of the present invention is illustrated. The illustrated writing instrument **10** includes elongated first and second barrel portions **12**, **14**. The first barrel portion **12** has an open first end **12a** and an open second end **12b**. As would be understood

by those of skill in the art, a writing element (not shown) is extended and retracted through the open first end **12a**. Various types of writing elements (*e.g.*, flair-tip writing elements, ball-point writing elements, etc.) may be utilized in accordance with embodiments of the present invention. Writing elements are well known to those of skill in the art, and will not be further described herein. Embodiments of the present invention are not limited to a particular style of writing instrument or to a particular type of writing element.

The illustrated first and second barrel portions **12**, **14** have generally cylindrical configurations. However, writing instruments according to embodiments of the present invention may have barrel portions with various other shapes and configurations, without limitation.

The second barrel portion **14** is hollow and transparent, and includes an open end **14a** and a closed end **14b**. The transparent second barrel portion **14** may be formed from various transparent materials including, but not limited to, thermosetting polymers, thermoplastic polymers, glass, etc. A fluid **16** is disposed within the hollow second barrel portion **14**, and is retained therein via a plug **18** that is secured within the open end **14a**, as illustrated in **Figs. 2A-2B**. In the illustrated embodiment, the fluid **16** is translucent. Exemplary translucent fluids which may be utilized include, but are not limited to, water, glycerin, mineral oil, etc. Preferably, a non-toxic, environmentally-neutral fluid is utilized for the fluid **16**. According to embodiments of the present invention, the fluid **16** may have color and/or may be substantially opaque. Embodiments of the present invention are not limited to the use of translucent fluids.

Also disposed within the hollow second barrel portion **14** in the illustrated embodiment are a plurality of objects **17** which are configured to move through the translucent fluid **16** when the writing instrument **10** is inverted relative to horizontal. Movement of the objects within the translucent fluid **16** is viewable through the transparent second barrel portion **14**.

In the illustrated embodiment, each of the objects **17** includes promotional indicia **19** displayed thereon. Various types of promotional indicia including, but not limited to, lettering, designs, characters, logos and other symbols, may be utilized in accordance with embodiments of the present invention. The term "lettering" as used herein includes, but is not limited to, alphabetical characters and alphanumeric characters.

Embodiments of the present invention are not limited to the configuration and size of the illustrated objects **17**. Objects **17** may have any size, color, shape and the like depending on the overall appearance desired. In addition, various numbers of objects **17** may be utilized. Embodiments of the present invention are not limited to the illustrated number of objects **17**. According to other embodiments of the present invention, the viscosity of the fluid and buoyancy of the objects **17** may be selected such that certain ones of the objects **17** ascend and/or descend within the fluid **16**.

According to other embodiments of the present invention, two or more fluids may be disposed within the hollow second barrel portion **14**. **Fig. 4** illustrates two translucent fluids **16, 16'** disposed within the hollow second barrel portion **14** of a writing instrument **110**. The two translucent fluids **16, 16'** may have

respective viscosities that are substantially the same or substantially different. Moreover, the two translucent fluids **16**, **16'** may be clear or may have different colors. In the illustrated embodiment, the two fluids **16**, **16'** are substantially insoluble in each other.

Referring back to **Figs. 2A-2B**, the illustrated open end **14b** of the second barrel portion **14** has a generally cylindrical shape with an outside diameter D_1 that is slightly less than the outside diameter D_2 of the adjacent portion **14c** of the second barrel portion **14**, and slightly less than the inside diameter D_3 of the first barrel portion second end **12b**. When assembled, the open end **14a** of the second barrel portion **14** is inserted within and secured to the second end **12b** of the first barrel portion **12**.

The first and second barrel portions **12**, **14** may be secured together in various ways, without limitation. For example, the open end **14a** of the second barrel portion **14** may be adhesively secured within the second end **12b** of the first barrel portion **12**. The open end **14a** of the second barrel portion **14** may be threadingly secured within the second end **12b** of the first barrel portion **12**. The open end **14a** of the second barrel portion **14** may be press-fit within the second end **12b** of the first barrel portion **12**.

Referring to **Fig. 3**, the open end **14a** of the second barrel portion **14** has an annular rim **20**, an internal surface **22** and an external surface **24**, as illustrated. The plug **18** includes a shank **30** and a head portion **32** connected to the shank **30**. The head portion **32** extends radially outward from the shank **30** to define a circumferential shoulder **34**. When the shank **30** is disposed within the open end **14a**, the shoulder **34** is in

contacting relationship with the annular rim **20** (**Figs. 2A-2B**).

According to embodiments of the present invention, the second barrel portion **14** and the plug **18** are formed from polymeric material and the plug **18** is sonically welded to the second barrel portion open end **14a**. Under sonic welding, the plug **18** and second barrel portion open end **14a** are subjected to high-frequency sound waves which vibrate the polymeric material and cause friction, which results in high, focused heat. This heat melts or welds the plug **18** and second barrel portion open end **14a** together. The process is very clean and allows for a strong, nearly unbreakable bond to be formed. Sonic welding is well understood by those skilled in the art and need not be described further herein. According to alternative embodiments, the plug **18** and second barrel portion open end **14a** may be secured together via the use of an adhesive.

In the illustrated embodiment, the plug head portion **32** tapers radially inward such that the head portion **32** does not contact the inside surface **12c** of the first barrel portion second end **12b** and such that flexure of the first and second barrel portions **12**, **14** relative to one another (as illustrated in **Fig. 2B**) does not cause the head portion **32** to contact the inside surface **12c** of the first barrel portion second end **12b**. The tapered configuration of the plug head portion **32** prevents contact with the inside surface **12c** of the first barrel portion second end **12b** even under such extreme bending.

By avoiding contact, the plug **18** remains undisturbed, thereby avoiding any loss of sealing ability. If the head portion **32** were to undergo a force from contact with the inside surface **12c**, the plug **18** could become dislodged within the second barrel portion

open end **14a** which could enable some or all of the fluid **16** to escape from the second barrel portion **14**, which would be undesirable.

The plug head portion **32** may have various radially-tapering configurations. For example, in **Fig. 5**, the plug head portion **32'** has a rounded configuration.

Referring to **Fig. 6**, according to other embodiments of the present invention, a writing instrument **210** includes a light **40** that is configured to illuminate the fluid **16** within the hollow second barrel portion **14**. In the illustrated embodiment, the light **40** is disposed within the first barrel portion second end **12b**. A power source (*e.g.*, battery) **42** is disposed within the first barrel portion adjacent the light **40**. A user-activateable switch **44** is located on the first barrel portion **12** and is in communication with the light **40** and power source **42**. The switch **44** is responsive to user activation for switching the light **40** on and off. Various types of lights **40**, power sources **42**, and switched **44** may be utilized in accordance with embodiments of the present invention.

The foregoing is illustrative of the present invention and is not to be construed as limiting thereof. Although a few exemplary embodiments of this invention have been described, those skilled in the art will readily appreciate that many modifications are possible in the exemplary embodiments without materially departing from the novel teachings and advantages of this invention. The invention is defined by the following claims, with equivalents of the claims to be included therein.